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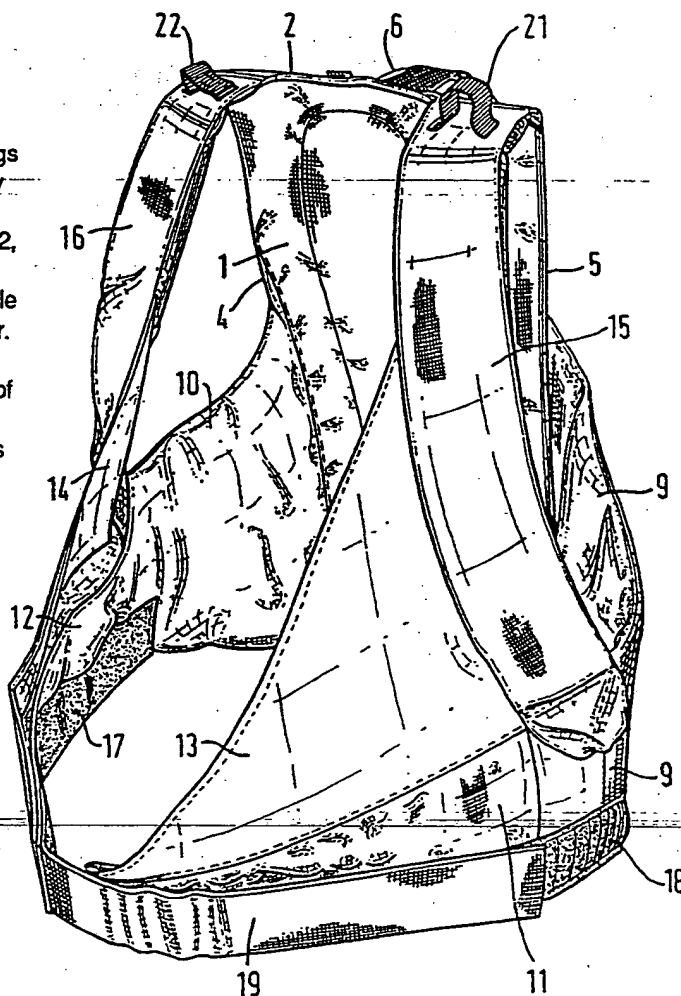
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(54) A garment constituting an easy-to-don harness

(57) A garment constituting an easy-to-don harness comprises a back portion 1 having thereon a pouch 6 for supporting a gas cylinder for compressed air breathing apparatus, and front portions each connected to the back portion 1 at the top of the back portion and at the lower parts of the side edges of the back portion to form openings through which a wearer of any size may quickly and easily put his arms when wishing to don the garment. The front portions include substantially triangular flaps 11, 13 and 12, 14 providing crossover flaps at the lower edges of which surface contact fastening means 17, 18 constitutes the sole means for securing the garment on the body of the wearer. One fastening means 17 includes an elongated strip 19 extending beyond the flap so that the fastening means is of sufficient length to be secured tightly on a person of large waist size, the back portion 1 also having fastening means 18 to secure the elongated strip 19 when the garment is worn by a person of small waist size.

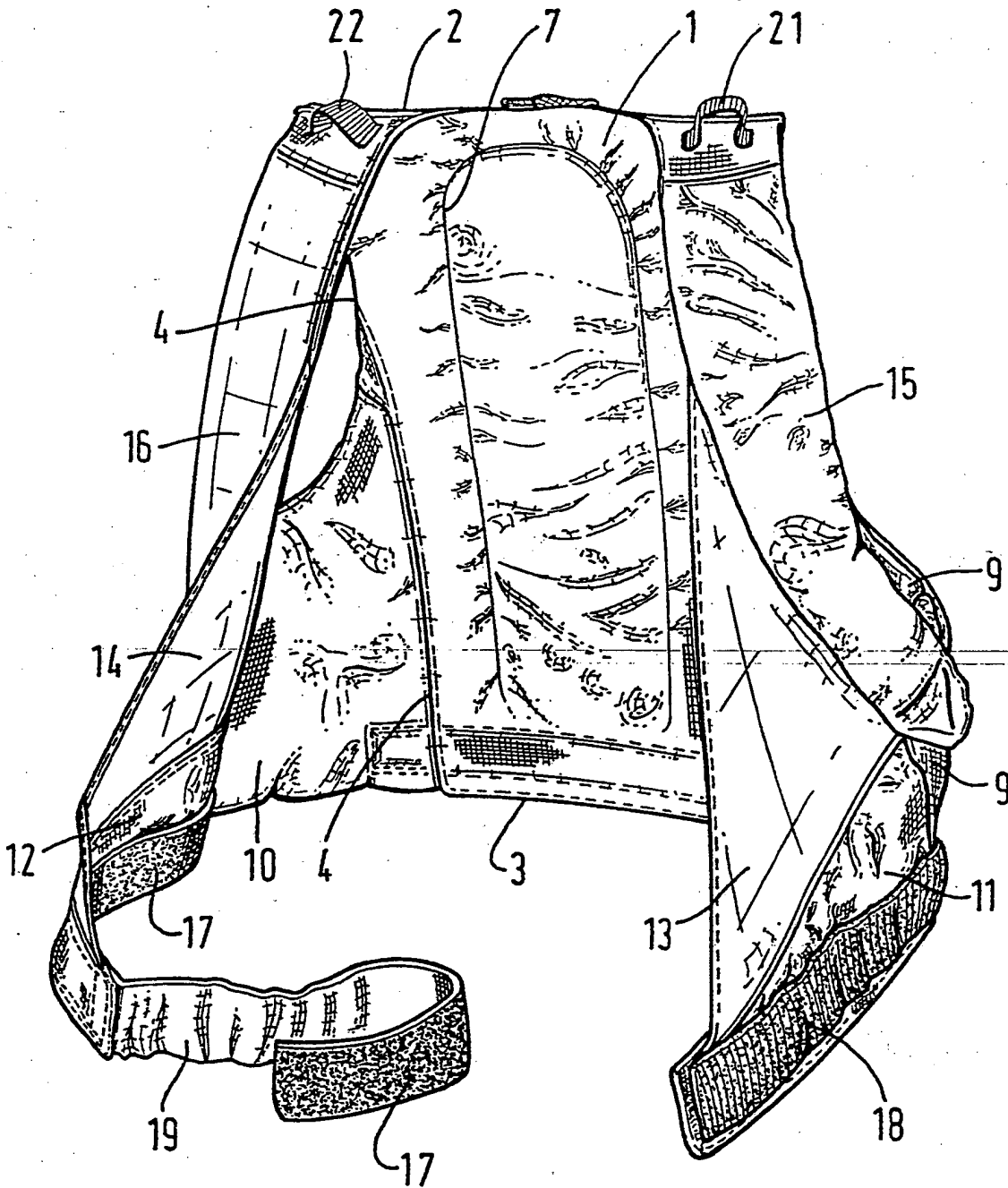
FIG. 5



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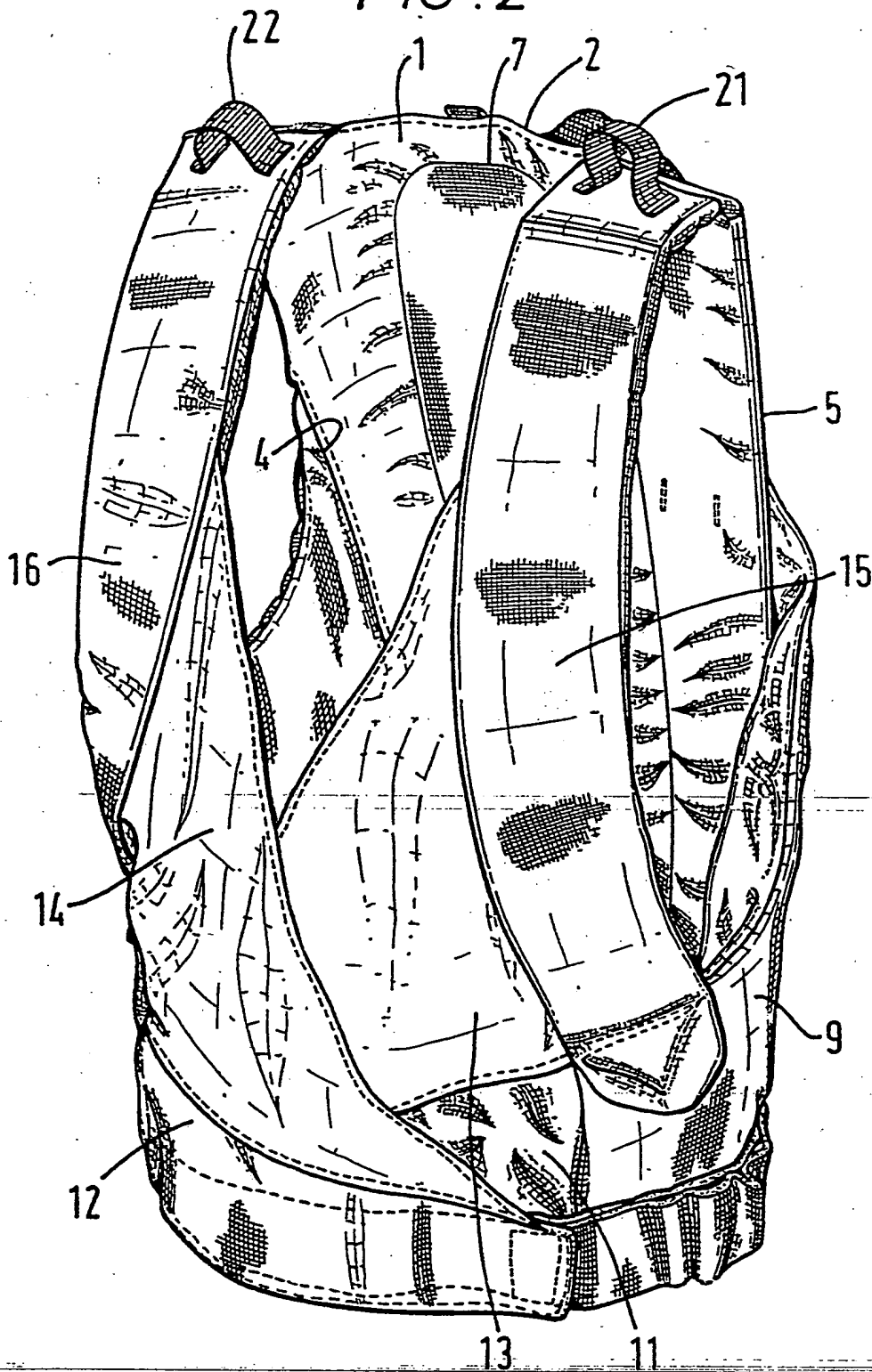
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FIG. 1



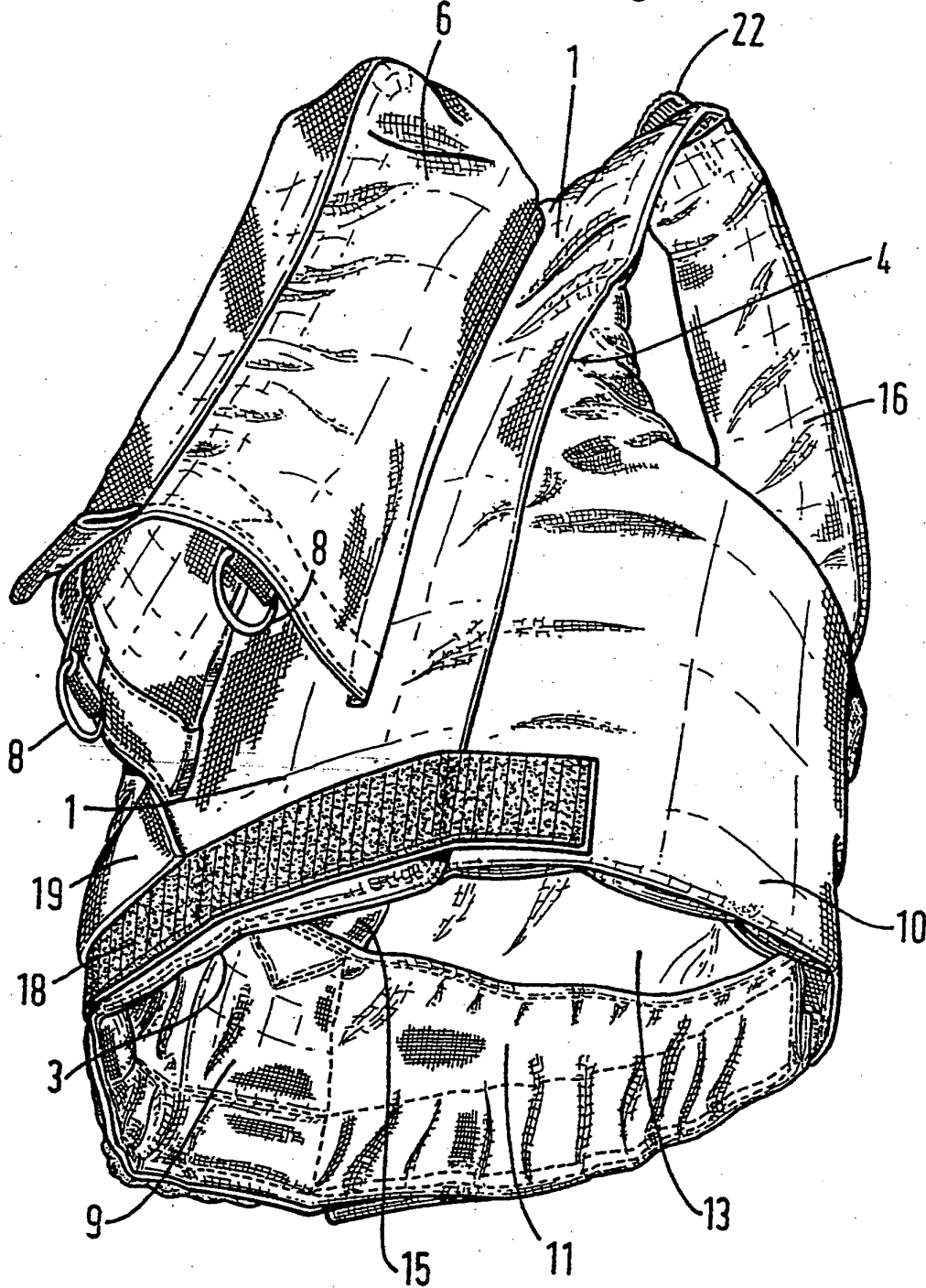
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FIG. 2



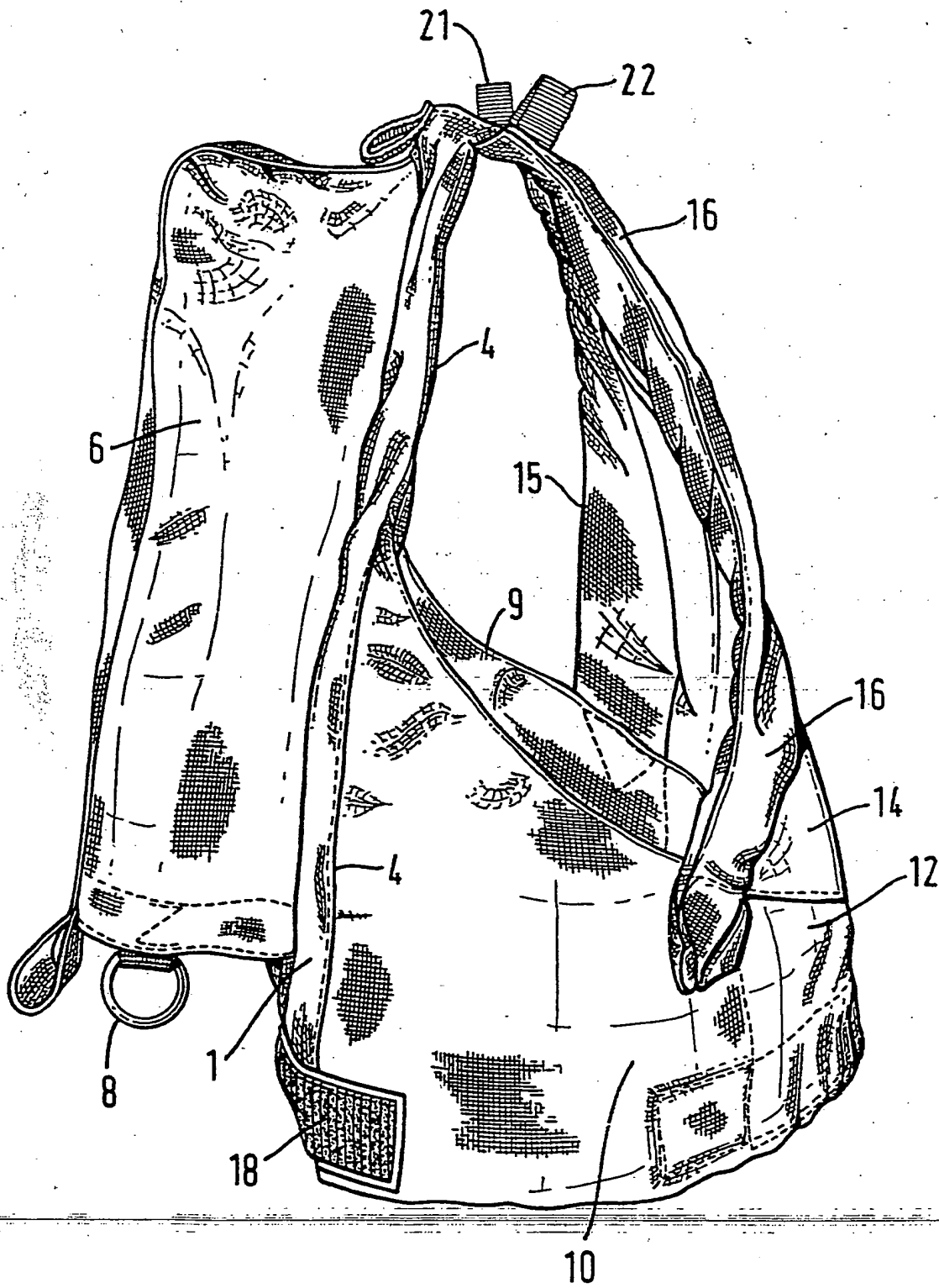
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FIG. 3



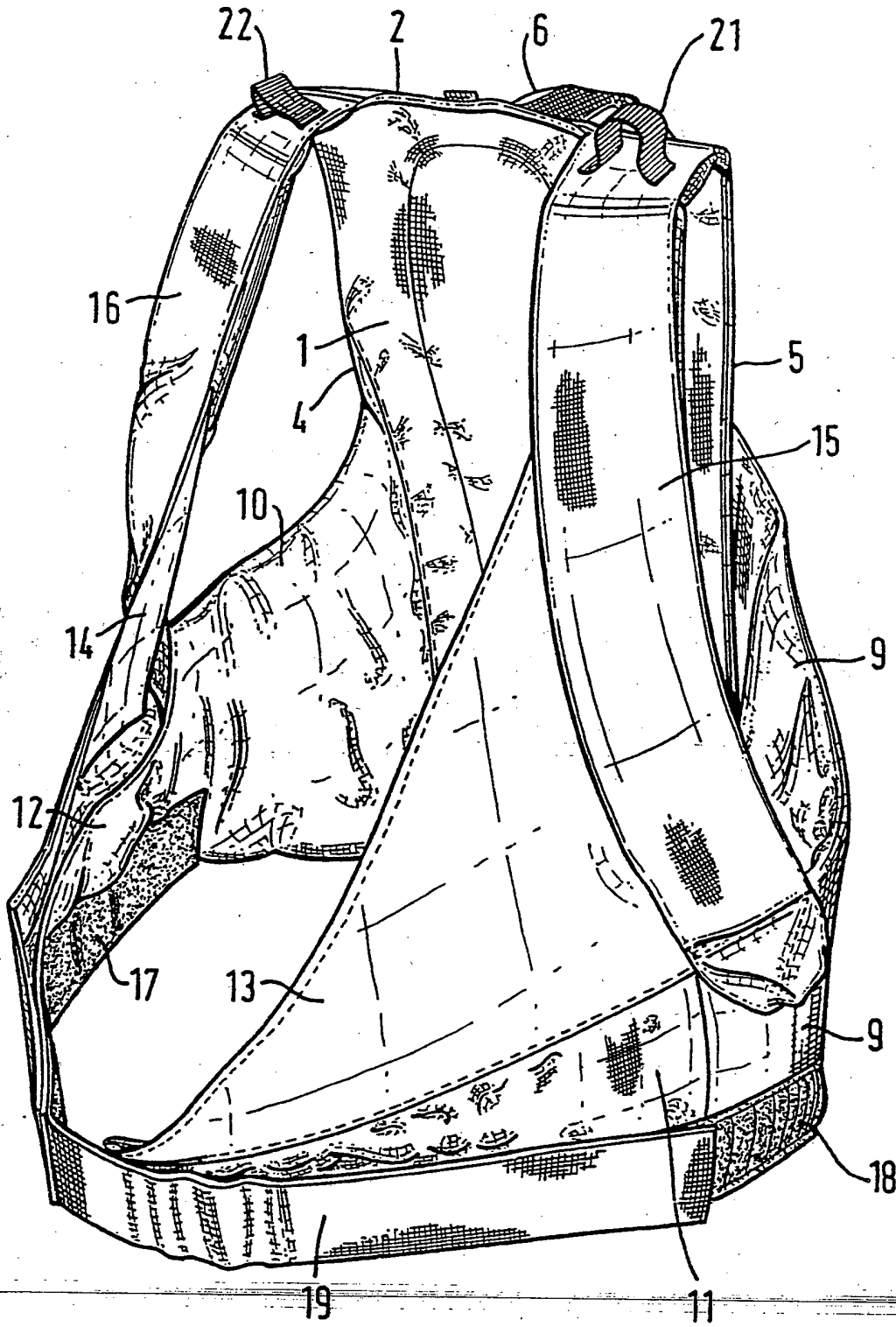
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FIG. 4



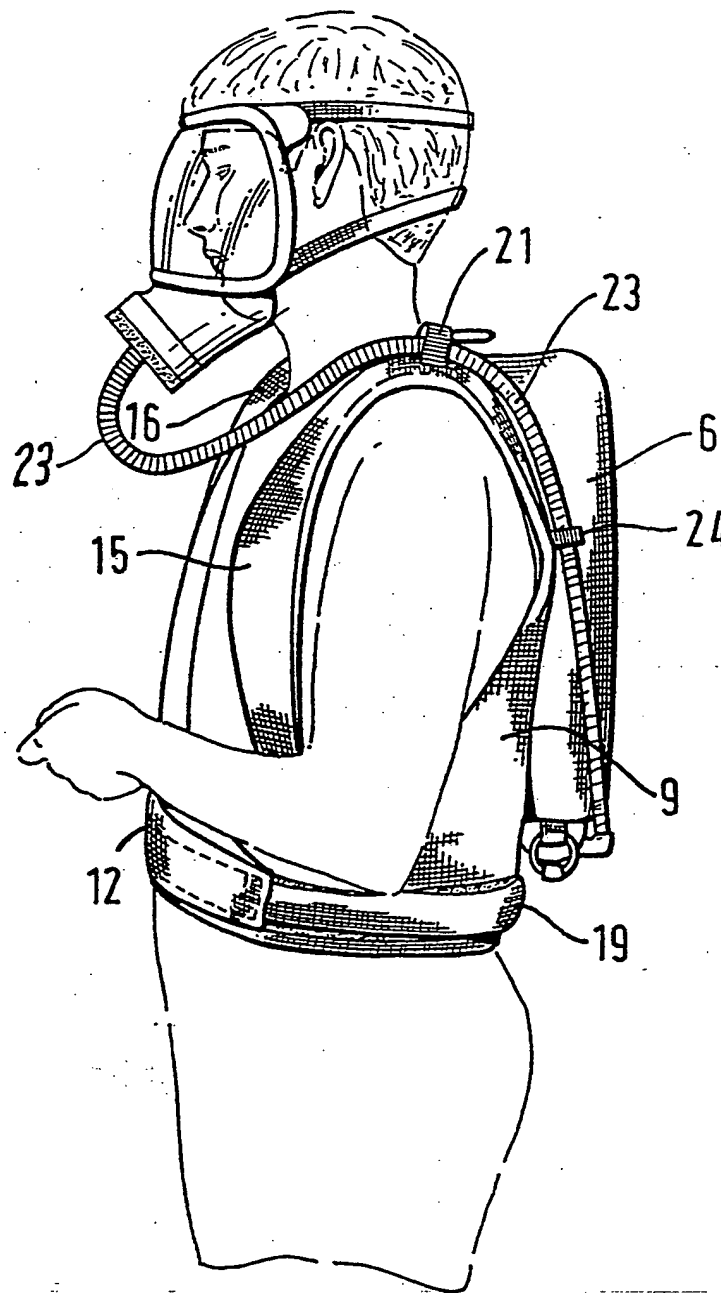
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FIG. 5



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FIG. 6



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A GARMENT CONSTITUTING AN EASY-TO-DON HARNESS

This invention relates to a garment constituting an easy-to-don harness for a load such as a cylinder of compressed air breathing apparatus.

Although the garment in accordance with the present invention has application in other fields, a particular need for a garment of the kind which will be described and claimed herein arises in connection with the use of self-contained compressed air breathing apparatus. One conventional apparatus of this kind has been categorised as 'rescue breathing apparatus' and has been of 20 mins working duration at an average breathing rate of 40 litres per minute. Such breathing apparatus conventionally consists of a face mask connected by a suitable hose to a gas cylinder mounted on a metal frame which is carried on the wearer's back by a harness including adjustable shoulder straps and an adjustable waist strap. In donning the known harness the wearer first adjusts the shoulder straps to support the gas cylinder on his back and then secures the adjustable waist strap.

A need has arisen for a rescue breathing apparatus of a shorter duration which can be donned quickly without delay in adjusting straps and belt in order to deal with an emergency in the presence of a toxic atmosphere.

It is therefore an object of the present invention to provide a garment which is quick to put on and which will support the load of a gas cylinder on the back of a person.

According to the present invention there is provided a garment constituting an easy-to-don harness

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for a load such as a cylinder of compressed air breathing apparatus, the garment essentially comprising a back portion having thereon means for supporting the load and front portions providing crossover flaps at or near the lower edges of which there are provided surface contact fastening means which constitute the sole means for securing the garment on the body of the wearer.

The garment in accordance with the present invention is essentially of the type of a waistcoat. Because the surface contact fastening means are the only means for securing the garment, the garment constitutes a harness which can be quickly donned by persons of different sizes without need for delay in making adjustments to the harness.

More specifically in accordance with the present invention there is provided a garment constituting an easy-to-don harness for a load such as a cylinder of compressed air breathing apparatus the garment comprising a back portion having thereon means for supporting the load, a pair of front portions each joined to or integral with the back portion, each front portion defining, with the back portion, an aperture substantially larger than a conventional armhole, and each front portion including a flap having a horizontal lower edge and a sloping upper edge such that the garment has crossover flaps, and cooperating surface contact fastening means secured to the flaps adjacent to the lower edges of the flaps, that one of the cooperating fastening means which presents an inwardly facing surface including an elongated strip extending substantially beyond the flap, and the back portion of the garment having, adjacent to a lower edge thereof, cooperating surface contact fastening means for securing the elongated strip thereto.

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A garment in accordance with the present invention may be worn by a large range of sizes of adult person whilst providing the advantages already mentioned, the range of person who may readily wear the garment in accordance with the present invention extending from 5 to 95 percentile adult size torsos.

In an embodiment of the present invention which will be described, the back portion is made separately from the two front portions, which are joined to the back portion at an upper edge and a side edge of the back portion. Preferably the back portion is made of a padded fabric material and each front portion includes a padded fabric strap joined to the padded fabric back portion.

The back portion of the garment may be made of a plurality of pieces of padded fabric material enabling the load such as a gas cylinder to be supported away from the wearer's spine in a manner much more comfortable than the harness of conventional compressed air breathing apparatus.

Advantageously each crossover flap extends substantially diagonally between a padded fabric strap and the lowermost edge of the said flap, the flap thereby inhibiting any tendency of the strap to slip off the shoulder of the wearer.

In a preferred embodiment of the present invention the connection of each front portion of the garment to the back portion is effected, at the sides of the garment, by means of padded fabric side sections and, at the shoulders of the garment, by means of padded fabric straps connected at their upper ends to the upper edge of the back portion and connected at their lower ends to the respective side sections. Each

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padded fabric strap and the associated padded fabric side section forms a part of one of the front portions of the garment.

A part of each side edge of the back portion of the garment defines, together with an upper edge of a respective padded fabric side section and an associated padded fabric strap, an aperture of substantially greater depth than conventional armholes.

Preferably, that one of the cooperating fastening means which presents an outwardly facing surface extends continuously adjacent to substantially the whole length of the lower edge of the flap of that front portion to which it is secured and adjacent to substantially the whole length of the lower edge of the back portion.

In accordance with a specific embodiment of the present invention there is provided a garment wherein the fastening means comprises cooperating hook and loop fastening means.

According to a specific embodiment of the present invention which will be described herein there is provided a garment of a waistcoat-type constituting an easy-to-don harness for self-contained compressed air breathing apparatus, the garment comprising a padded fabric back portion having an upper edge, a lower edge and side edges and having thereon a pouch for holding a gas cylinder, padded fabric side sections each joined to at least the lower part of one side edge of the back portion, padded fabric straps each joined to the upper edge of the back portion and to a respective side section, each padded fabric strap forming in conjunction with the padded fabric back portion and a respective padded fabric side section an aperture of substantially greater depth than a

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conventional armhole, substantially triangular fabric portions each forming, with an associated padded fabric strap and an associated padded fabric side section a substantially triangular flap of a size to extend substantially diagonally across the chest of a person of average size to form a pair of crossover flaps, and cooperating hook and loop fastening means near the lower edges of the flaps, that one of the cooperating fastening means which is on the inner surface of a flap including an elongated strip of substantial length extending beyond the flap in a direction around the waist of the wearer and that one of the cooperating fastening means on the outer surface of a flap extending continuously adjacent to the lower edge of the flap, a lower edge of the associated side section and the lower edge of the back portion, whereby the elongated strip of the other cooperating fastening means may be firmly secured around the waist of a person of substantially less than average size wearing the garment.

When the load is a cylinder supplying breathable gas to breathing apparatus worn by a wearer the padded straps conveniently include loops at shoulder level for retaining hose for supplying gas from the cylinder to the breathing apparatus.

The present invention will be further understood from the following detailed description of a preferred embodiment thereof which is made, by way of example, with reference to the accompanying drawings, in which

Figure 1 is a front perspective view of a garment ~~constituting an easy-to-don harness in accordance with~~ the present invention in an open position,

Figure 2 is a front perspective view of the garment

of Figure 1 in a closed or fastened position such as it would adopt when worn by a person of average size,

Figure 3 is a perspective view from the back and below of the garment in the position of Figure 2,

Figure 4 is a side view of the garment of Figures 2 and 3,

Figure 5 is a front perspective view of the garment of Figure 1 in a closed or fastened position such as would be adopted when the garment is worn by a person of substantially larger than average size, and

Figure 6 shows the garment of the preceding Figures in use by a person of average size as a harness for self-contained breathing apparatus, the gas cylinder of which is supported on the wearer's back.

Referring to Figures 1 to 5 of the accompanying drawings, a garment constituting an easy-to-don harness for compressed air breathing apparatus includes a back portion 1 having an upper edge 2, a lower edge 3 and side edges 4 and 5. The back portion 1 is made of two thicknesses of fabric material, for example polyester, between which a layer of padding is secured by stitching. The padding may be a single pad of foamed plastic material or there may be more than one pad of foam or other cushioning material, for example a pair of foam pads located either side of a notional centre line of the back portion corresponding to the wearer's spine.

Secured to the padded fabric back portion 1 is a pouch 6 which is made of fabric material stitched to the back portion 1 by stitching 7 as seen in Figures 1, 2 and 5. The pouch 6 is so arranged that a cylinder of

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breathing gas such as air or oxygen may be inserted from the bottom of the pouch and secured in position using the rings 8.

Secured to the lower parts of the side edges 4 and 5 of the back portion 1 are padded fabric side sections 9 and 10 which are constituted by two pieces of fabric stitched together with padding therebetween. The side sections 9 and 10 are padded in order to give form to the garment for ease of donning. The padding used in the side sections may therefore be different from the padding used in the back portion 1 which provides cushioning for the weight of the gas cylinder held in the pouch 6 in addition to providing form to the garment.

In the embodiment of the invention illustrated in Figures 1 to 5 two pieces of fabric of similar substantially triangular shape are used to form the respective side sections 9 and 10 and the lower parts 11 and 12 of substantially triangular flaps, the upper parts 13 and 14 of which are formed of a single layer of fabric material. The substantially triangular flaps comprised respectively by fabric material 11,13 and 12,14 have horizontal lower edges and sloping upper edges of a size to extend substantially diagonally across the chest of a person of average size to form a pair of crossover flaps, as shown particularly in Figure 2.

Padded fabric straps 15 and 16 are each secured at one end to the upper edge 2 of the back portion 1 to constitute shoulder straps and, at their lower ends, ~~the padded fabric straps are secured to respective~~ padded fabric side sections 9 and 10. The straps 15 and 16 are preferably foamed plastics strips enclosed

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in fabric. The straps 15 and 16, being load bearing, are thus well-cushioned for the wearer's comfort.

Each padded fabric strap 15,16 forms, together with a side edge 5 or 4 of the back portion 1 and a respective padded fabric side section 9 or 10, an aperture of a depth substantially greater than the depth of any conventional armhole. The apertures formed by the padded fabric straps 15,16, the back portion 1 and the padded fabric side sections 9 and 10 provide openings through which a wearer of any size may quickly and easily put his or her arms when wishing to don the garment and its associated breathing apparatus swiftly in an emergency. The apertures may, for example, have a depth of the order of 30 to 35 cms and a circumference of the order of 75 to 90 cms. The back portion 1 conveniently has a depth from the neck to the bottom measured near the centre of the back portion in the range of 50 cm to 70 cm and the circumference of the garment measured from edge to edge, that is to say from the farthest extremity at the lower edge of one flap to the similar farthest extremity at the end of the opposing flap, is in the range of 130 cm to 170 cm. The elongated strip 19, which constitutes a quick fastening waist strap, is of the order of 30 cm to 35 cm, for example 33 cm.

The padded fabric side section 9, the flap, constituted by the lower part 11 and upper part 13, and the padded fabric strap 15 together constitute one front portion of the garment. Similarly, the padded fabric side section 10, the lower part 12 and upper part 14 which together constitute the other flap, and the padded fabric shoulder strap 16 together constitute the other front portion of the garment. A loop 21 or 22 is provided near the top of each padded

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fabric shoulder strap 15 or 16 in order to guide the hose bringing breathable gas from a cylinder in the pouch 6 to a face mask worn by a wearer of the garment as will be described below in relation to Figure 6. The loops may be extended into tunnels of a length of the order of 8 cms, the hose being passed through an appropriate tunnel.

The garment in accordance with the present invention includes cooperating hook and loop fastening means 17 and 18 secured respectively adjacent to the lower edges of the lower portions 12 and 11 of the two flaps. However, each of the cooperating hook and loop fastening means, which may, for example, be the fastening material obtainable under the trade name "Velcro", extend substantially beyond the respective flap. The fastening means 17 extends beyond the open end of its flap as an elongated strip 19, and the fastening means 18 continues from the fabric portion 11 across near the lower edge of the padded fabric side section 9 and around the back portion 1 near the lower edge 3 of the back portion 1 to the padded fabric side section 10 as shown in Figure 3.

The garment as described and illustrated in Figures 1 to 5 is capable of being worn by adult persons of almost any size. Whatever the size of person the cooperating hook and loop fastening means are brought into engagement over the fullest areas possible when the flaps of the garment are pulled as far as they will go across the front of the wearer. In the case of a small adult such as a small, slight woman the elongated strip 19 of the fastening means 17 may extend ~~almost completely around the waist of the wearer~~ engaging with the fastening means 18 right across the back portion 1 and even on the padded fabric side section 10 on the same side of the garment to which

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the fastening means 17 is secured.

In the case of a person of average size the elongated strip 19 of the fastening means 17 will extend partially around the waist leaving a considerable section of the fastening means 18 uncovered as shown in Figure 3. When the garment is worn by a person of very large size, such as an 18 stone man, the elongated strip 19 carrying fastening means 17 may extend simply across the other flap and not reach to the side section 9, as shown in Figure 5.

In every case the garment when worn is quickly and tightly secured about the wearer. With a person of average size, the securing means will be at waist level whereas with a very much larger person the securing means may be at chest level and with a very small person the securing means may be below waist level, nearer to the hips.

When the garment in accordance with the present invention is donned by a person of average or less than average size, the weight of the gas cylinder in the pouch 6 is supported at the waist or hips of the wearer, and in this way the weight of the gas cylinder is taken off the spine of the wearer.

The fabric parts 13 and 14 constituting the upper parts of the crossover flaps being secured to the respective padded fabric straps 15 and 16 tension the upper parts of the padded fabric straps across the chest of the wearer thereby ensuring that the padded fabric straps do not slip from the shoulders of the wearer, particularly in the case of a barrel-chested wearer.

Referring to Figure 6 of the accompanying drawings,

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a garment as described with reference to Figures 1 to 5 is shown being worn by a person of average size, the pouch 6 containing a cylinder of air. The garment has been secured by the wearer through the hook and loop fastening means at waist level with the elongated strip 19 extending around the wearer's waist to engage the fastening means 18 along the whole length of the lower edge of the padded side section 9 and even on the lower edge of the back portion.

Hose 23 is connected to the gas cylinder in the pouch 6 and extends through a loop 24 on the back portion, the loop 21 at the shoulder of the garment and over the wearer's chest to a face mask.

A garment of similar style may be made in substantially smaller size for use by children of a wide range of ages. When a garment according to the present invention is designed for use by children with breathing apparatus, the breathing gas may be supplied to a hood rather than a face mask.

CLAIMS

1. A garment constituting an easy-to-don harness for a load such as a cylinder of compressed air breathing apparatus comprising a back portion having thereon means for supporting the load and front portions providing crossover flaps at or near the lower edges of which there are provided surface contact fastening means which constitute the sole means for securing the garment on the body of the wearer.

2. A garment constituting an easy-to-don harness for a load such as a cylinder of compressed air breathing apparatus the garment comprising a back portion having thereon means for supporting the load, a pair of front portions each joined to or integral with the back portion, each front portion defining, with the back portion, an aperture substantially larger than a conventional armhole, and each front portion including a flap having a horizontal lower edge and a sloping upper edge such that the garment has crossover flaps, and cooperating surface contact fastening means secured to the flaps adjacent to the lower edges of the flaps, that one of the cooperating fastening means which presents an inwardly facing surface including an elongated strip extending substantially beyond the flap, and the back portion of the garment having, adjacent to a lower edge thereof, cooperating surface contact fastening means for securing the elongated strip thereto.

3. A garment according to Claim 1 or Claim 2 wherein the back portion is made of a padded fabric material and each front portion includes a padded fabric strap joined to the padded fabric back portion.

4. A garment according to Claim 3 wherein each crossover flap extends substantially diagonally between a padded fabric strap and the lowermost edge of the said flap, the flap thereby inhibiting any tendency of the strap to slip off the shoulder of the wearer.
5. A garment according to Claim 3 or Claim 4 wherein the front portions each include a padded fabric side section which, together with the back portion and the padded fabric strap of the associated front portion, define apertures of substantially greater depth than conventional armholes.
6. A garment according to any one of Claims 3 to 5 wherein that one of the cooperating fastening means which presents an outwardly facing surface extends continuously adjacent to substantially the whole length of the lower edge of the flap of that front portion to which it is secured and adjacent to substantially the whole length of the lower edge of the back portion.
7. A garment according to any one of the preceding Claims wherein the surface contact fastening means comprises cooperating hook and loop fastening means.
8. A garment of a waistcoat-type constituting an easy-to-don harness for self-contained compressed air breathing apparatus, the garment comprising a padded fabric back portion having an upper edge, a lower edge and side edges and having thereon a pouch for holding a gas cylinder, padded fabric side sections each joined to at least the lower part of one side edge of the back portion, padded fabric straps each joined to the upper edge of the back portion and to a respective side section, each padded fabric strap forming in conjunction with the padded fabric back portion and a respective padded fabric side section an aperture of substantially

greater depth than a conventional armhole, substantially triangular fabric portions each forming, with an associated padded fabric strap and an associated padded fabric side section a substantially triangular flap of a size to extend substantially diagonally across the chest of a person of average size to form a pair of crossover flaps, and cooperating hook and loop fastening means near the lower edges of the flaps, that one of the cooperating fastening means which is on the inner surface of a flap including an elongated strip of substantial length extending beyond the flap in a direction around the waist of the wearer and that one of the cooperating fastening means on the outer surface of a flap extending continuously adjacent to the lower edge of the flap, a lower edge of the associated side section and the lower edge of the back portion, whereby the elongated strip of the other cooperating fastening means may be firmly secured around the waist of a person of substantially less than average size wearing the garment.

9. A garment according to Claim 8 wherein each padded fabric side section and at least a lower part of the associated flap are formed from two pieces of fabric of similar shape stitched together such that a first part of each fabric constitutes the side portion and a second part of each fabric constitutes the lower part of the flap, padding being located between the first parts of the two fabrics.

10. A garment according to Claim 9 wherein each flap includes a single layer of fabric which is substantially triangular in shape, and which is stitched on one side to the associated padded fabric strap and is stitched on another side to upper edges of the second parts of the two fabrics which constitute the lower part of the flap.

11. A garment according to Claims 8 to 10 wherein the padded fabric back portion comprises a plurality of padded sections.
 12. A garment according to any one of Claims 3 to 6 and 8 to 11 for use in supporting a cylinder for supplying breathable gas to breathing apparatus worn by the wearer wherein the padded straps include loops near the ends of the straps which are joined to the back portion for retaining hose for supplying gas from the cylinder to the breathing apparatus.
 13. A garment adapted to be speedily donned by a wearer of any adult size substantially as hereinbefore described with reference to the accompanying drawings.
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Relevant Technical fields

(i) UK Cl (Edition K) A3V; B7A (AAJ)

(ii) Int Cl (Edition 5) A45F; A47D; A62B; B63C

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Search Examiner

D BUCKLEY

Date of Search.

13 NOVEMBER 1991

Documents considered relevant following a search in respect of claims 1 TO 13

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	GB A 2226533 (WALTERS) Figure 1	1 at least
A	GB A 2224635 (KAISHA) Figures 1, 3, & 6	1 at least
A	GB 1551958 (WITTENBERGER) Figure 1	1 at least



Category	Identity of document and relevant passages	Relevance to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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